Early life socioeconomic factors influence development of rheumatoid arthritis

By Robin Arnette

Parks said a few studies have also shown effects of maternal stress on later stress and immune responses in children. If true, the socioeconomic adversity and stressors that mothers endure may cross generations. (Photo courtesy of Steve McCaw)

Growing evidence, including a new study on rheumatoid arthritis (RA) by scientists at NIEHS, shows that exposures in early life can have long-term impacts on health.

Researchers found that children who experience adversity, such as food insecurity, have an increased risk of developing RA as adults. The article *(http://www.ncbi.nlm.nih.gov/pubmed/22586176)* appeared in the March issue of Annals of the Rheumatic Diseases, and is the first report to link childhood food insecurity with adult RA. The findings were the result of analysis of data from the NIEHS Sister Study, *(http://www.sisterstudy.niehs.nih.gov/English/about.htm)* a nationwide study of more than 50,000 women examining the environmental and familial origins of breast cancer.

Not having enough to eat was one of several characteristics considered as possible markers of lower socioeconomic status (SES), which also included young maternal age, and low household income and education level. The scientists were surprised to find, as a whole, lower SES was just as likely to be associated with RA as cigarette smoking, a well-known RA risk factor.

“Given the strength of this SES effect, we really need to understand what’s driving it,” said Christine Parks, Ph.D., a scientist in the NIEHS Epidemiology Branch and lead author of the work.

Looking for the cause of RA

RA is a systemic autoimmune disease in which a person’s body mistakenly attacks its own cells, leading to widespread and damaging inflammation in the joints. Parks initiated the research, because a small, but growing, body of literature suggests certain early life exposures and stressors could impact the developing immune system, with lifelong effects across many different diseases. The paper also examined other prenatal and birth characteristics, but none seemed to change the observed SES effects on disease risk.

Although the research relied on self-reporting — women saying they had been diagnosed with RA — Parks and her colleagues took steps to validate the participants’ responses.

“We know RA may be confused with rheumatism and other forms of arthritis, so if they answered yes to RA, we confirmed their diagnosis by looking at whether they were taking specific immunosuppressant medications, called disease-modifying anti-rheumatic drugs (DMARDs), or whether they reported specific symptoms and were taking steroids for RA,” Parks explained.

Based on this definition, Parks said less than 1 percent of the cohort had a diagnosis of clinically treated RA, but this number was likely an underestimate, since women receiving substandard care, or who experienced nonclassic symptoms, would have been excluded. The research team also took blood samples at enrollment, so future studies will examine early life exposures in relation to RA auto-antibodies and inflammatory markers, along with other autoimmune diseases, such as systemic lupus erythematosus.

Link between trauma and disease?

Parks said autoimmune diseases include more than 80 clinically distinct conditions. They affect between 5 and 8 percent of the U.S. population, and are among the top causes of mortality in reproductive-age women. If the biologic effects of early stress and lower SES on immunity are nonspecific, which Parks feels is likely, the study’s findings may suggest that childhood SES and related exposures could substantially impact autoimmune disease risk in the population.

While traumatic stressors during childhood are widespread in the population, Parks believes they may be more frequently experienced in women with lower SES, or have a greater impact on children who have fewer economic or social resources to buffer their effects. As part of ongoing efforts to understand the effects of childhood SES on the development of RA, her plans include the future examination of extensive information from cohort participants on their other early life environmental characteristics, social support, and traumatic stressors. She sees this work as part of a larger public health issue, and thinks this research adds to a growing understanding that childhood adversity may contribute to the development of many other chronic illnesses.

Citation: Parks CG, D'Aloisio AA, DeRoo LA, Huiber K, Rider LG, Miller FW, Sandler DP. *(http://www.ncbi.nlm.nih.gov/pubmed/22586176)* 2013. Childhood socioeconomic factors and perinatal characteristics influence development of rheumatoid arthritis in adulthood. Ann Rheum Dis 72(3):350-356.
